## 1 WHAT IS CLAIMED IS:

- 1 1. In an optical fiber communications system including a first node coupled to a second
- 2 node by an optical fiber, a method for transmitting overhead information from the first node to
- 3 the second node, the method comprising:
- 4 generating a control channel containing the overhead information;
- frequency division multiplexing the control channel with a plurality of electrical low-
- 6 speed channels to form an electrical high-speed channel;
- 7 converting the electrical high-speed channel from electrical to optical form to form an
- 8 optical high-speed channel; and
- 9 transmitting the optical high-speed channel over the optical fiber to the second node.
  - 2. The method of claim 1 wherein, within the optical high-speed channel, the control
  - channel is more robust than the low-speed channels to impairments in the optical fiber.
  - 3. The method of claim 1 wherein the control channel has a narrower frequency bandwidth than the low-speed channels.
  - 4. The method of claim 1 wherein, in the electrical high-speed channel, the control channel is located at a frequency lower than that of the electrical low-speed channels.
- I 5. The method of claim 1 wherein the control channel has a data rate of approximately 2
- 2 Mbps.

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1 6. The method of claim 1 wherein the overhead information includes software to be loaded

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- 2 onto the second node.
- 7. The method of claim 1 wherein the overhead information includes information for
- 2 controlling the second node.

	I	8.	The method of claim 1 wherein the overhead information includes information for	
	2	configuring the second node.		
	I	9.	The method of claim 1 wherein the overhead information includes diagnostic information	
	2	from to	esting one of the nodes.	
	1	10.	The method of claim 1 wherein the overhead information includes metrics from	
	2	measu	ring a performance of a fiber link between the first node and the second node.	
Hard Sant, 1964, 1	1	11.	The method of claim 1 wherein the overhead information includes information used for	
	2	fault isolation.		
	1	12.	The method of claim 1 wherein the overhead information includes information used to	
	2	establish a fiber link between the first node and the second node.		
my fran gen my fran Jrss. mad mad mad	I	13.	The method of claim 1 further comprising:	
Mary Harry	2		receiving the optical high-speed channel;	
# 15m7 #	3		converting the optical high-speed channel from optical to electrical form to recover the	
the state of the s	4		electrical high-speed channel; and	
	5		frequency division demultiplexing the control channel from the electrical high-speed	
	6		channel.	
	1	14.	The method of claim 1 further comprising:	
	2		generating a second control channel containing second overhead information;	
	3		frequency division multiplexing the second control channel with a second plurality of	
	4		electrical low-speed channels to form a second electrical high-speed channel;	
	5		converting the second electrical high-speed channel from electrical to optical form to	
	6		form a second optical high-speed channel; and	

second node to the first node.

transmitting the second optical high-speed channel over a second optical fiber from the

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ı	l	15.	An optical fiber communications system for transmitting at least two low-speed channels
2	2	across	the communications system, the communications system comprising:
ź	3		a first node including:
4	4		an FDM multiplexer for combining a control channel with the low-speed channels
	5		into an electrical high-speed channel; and
(	6		an E/O converter coupled to the FDM multiplexer for converting the electrical
	7		high-speed channel from electrical to optical form to form an optical high-
,	8		speed channel.
	1	16.	The communications system of claim 14 wherein, within the optical high-speed channel,
	2	the cor	ntrol channel is more robust than the low-speed channels to impairments in the optical
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ing year	1	17.	The communications system of claim 14 wherein the control channel has a narrower
	2	freque	ncy bandwidth than the low-speed channels.
		18.	The communications system of claim 14 wherein, in the electrical high-speed channel,
He Hard make with that with	2	the co	ntrol channel is located at a frequency lower than that of the electrical low-speed channels.
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i ei	I	19.	The communications system of claim 14 further comprising:
	2		a second node coupled to the first node by an optical fiber, the second node including:
	3		an O/E converter for converting the optical high-speed channel to the electrical
	4		high-speed channel; and
	5		a FDM demultiplexer coupled to the O/E converter for frequency division
	6		demultiplexing the control channel from the electrical high-speed channel.
	1	20.	The communications system of claim 19 wherein:
	2		the second node further comprises:

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an FDM multiplexer for combining a second control channel with second low-
speed channels into a second electrical high-speed channel; and
an E/O converter coupled to the FDM multiplexer for converting the second
electrical high-speed channel from electrical to optical form to form a
second optical high-speed channel; and
the first node further comprises:
an O/E converter for converting the second optical high-speed channel to the
second electrical high-speed channel; and
a FDM demultiplexer coupled to the O/E converter for frequency division
demultiplexing the second control channel from the second electrical high-
speed channel.